REMARKS

Claims 1-9 are now pending in the present application. Claim 1 has been amended to include recitations from claim 2. Accordingly, claim has been amended to recite "90°C or 120°C". The amendments to claims 1and 2 find support at page 3, lines 9-18 of the specification. Newly presented claim 9 finds support at page 2, line 30 of the specification. The amendments to the claims and newly presented claim do not introduce any new matter.

The objection to the language in claim 2 has been addressed in the amendments to the claims.

Claims 1-8 were rejected under 35 USC 103(a) as being unpatentable over either US Patent 4,214,058 to Imamura et al. or JP 05065370 to Aoyama alone or in view of US Patent 4,654,271 to Mauer et al. and as further evidence by http://fscimage.fishersci.com/msds/95661.htm. The cited references do not render obvious the present invention.

An important aspect of the present invention resides in the use of 0.1 to 3 parts by weight of the metal acetylacetonate having an average particle size of 50 μm or less, preferably 10 to 20 μm (please see new claim 9) in 100 parts by weight of the rubber component, wherein the rubber component and the metal acetylacetonate are mixed by controlling the highest temperature during mixing of 140°°C or less, preferably 90 to 120°C (please see the amended claim 2), whereby the dispersibility of the metal acetylacetonate in the rubber component is improved and the decrease in the strength at break can be preferably suppressed. As a result, according to the use of the adhesive rubber composition of the present invention, the properties at break can be improved, while maintaining the bondability with steel cord, etc, as shown in the Examples of the present application. Thus, the present adhesive rubber composition can be advantageously used as an adhesive rubber composition for covering the steel cords of tires and belt cord rubber for large-sized vehicles such as tracks and buses.

As shown in Table II on page 8 of the specification, when the cobalt (III) acetylacetonate having a particle size of 50 μm or less (i.e., Example 1 = 10 μm, Example 2 = 50 μm, Example 3 = 20 μm) show the decrease in the strength at break can be comparative to, or suppressed, when compared with the non-use of the cobalt (III) acetylacetonate (see comparative Example 2 of Table II), and show superior strength at break when compared with those, which include the cobalt (III) acetylacetonate having an average particle size of more than 50 μm (i.e., Standard Ex. 7. ("Comp. Ex. 1" in Table 11 should read "Standard Ex. 1") = 200 μm, Standard Ex. 2 = 100 μm).

In addition, also as shown in Table II, the strengths at break when the mixing temperatures are 100°C, 120°C and 140°C are superior to those obtained at the mixing temperature of more than 140°C (i.e., 160°C, 180°C) .

Namely, the strengths at break (index) in the case of the sizes of 10 μm, 20 μ m and 100 μm are as follows see Table II).

	Size of Co (III) acetylacetonate		
Mixing Temp.	10 μm*1	20 μm*2	100 μm*3
120 °C	100.8	99.6	86.2
160°C	95.1	93.3	88.4

*1: See Example 1, *2: See Example 3 *3: See Standard Example 2

The above results are completely absent in the cited References.

Imamura suggests a vulcanizable rubber composition having an excellent adhesive property when vulcanized in contact with metals compounding (a) 100 parts by weight of raw rubber, (b) 0.5 to 10 parts by weight of a vulcanizing agent, (c) 0.01 to 1 part by weight (as metal content) of at least one metal compound selected from the class consisting of organic acid salts complex compounds of titanium, molybdenum and organic compounds of titanium, molybdenum and cobalt.

However, Imamura neither discloses nor teaches the use of the metal acetylacetonate having an average particle size of 50 μm or less, preferably 10 - 20 μm at the highest mixing temperature of 140 °C or less, preferably 90-120 °C and the advantageous results obtained therefrom.

Aoyama (JP'370) suggests a rubber composition comprising 100 parts by weight of a rubber (NR, 1R, BR and/or SBR), 0.1 - 0.6 parts by weight, in terms of a cobalt metal, of acetylacetone cobalt and 3-8 parts by weight of sulfur for the purpose of decreasing vulcanization time.

However, again, this Citation neither discloses nor teaches the use of the metal acetylacetonate having an average particle size of 50 μm or less, preferably 10 - 20 μm at the highest mixing temperature of 140 °C or less, preferably 90-120 °C and the advantageous results obtained therefrom.

Mauer et al. (U5'271) suggest compounds containing an organic thiosulphate anion and cationic nickel or cobalt in association with an amine, are useful in increasing the bond strength between metal, especially brass, and vulcanized rubber. Typical complexes are those where the anion is dodecylthiosulphate or hexamethylenebis(thiosulphate), and the amine is ethylenediamine or N-benzyl-N-t-octylamine.

However, Mauer et al. neither discloses nor teaches the use of the metal acetylacetonate having an average particle size of 50 μm or less, preferably 10-20 μ m at the highest mixing temperature of 140 °C or less, preferably 90-120°C and the advantageous results obtained therefrom.

US'271 suggests the use of the rubber metal adhesion promoter (i.e., a complex containing an organic thiosulfate anion and cationic nickel or cobalt in association with an amine) in the form of a fine powder (7 0 μm or less) as a rubber/metal bonding promoter. However, the present invention can be distinguished from US'271 in the following points:

(a) US'271 neither discloses nor teaches the use of the metal acetylacetonate; and

(b) US`271 neither discloses nor teaches the use of the metal acetylacetonate having an average particle size of 50 μm or less, preferably 10-20 μm at a maximum mixing temperature of 140°C or less, preferably 90-120°C, whereby the desired balance of the bondability of the adhesive rubber composition to a metal and the good strength at break can be obtained. This is completely absent in US'271, as well as the other two cited references. As is well-known in the art, the bondability and the strength at break are quite different properties and there are no correlations there between. According to the present invention, the excellent combination of these different non-related properties can be advantageously obtained by the combination of the specified average particle size of the metal acetylacetonate and the mixing temperature of the rubber component and the metal acetylacetonate. Consequently, claims 1 - 9 are not obvious from the cited references.

Having demonstrated that the cited references fail to disclose or suggest the invention as claimed, and all other formal issues having now been fully addresses, the application is believed to be in condition for allowance. Accordingly, Applicants request early and favorable reconsideration in the form of a Notice of Allowance.

In the event that the examiner believes that an interview would advance the prosecution of this application in any way the undersigned is available at the phone number noted below.

If any additional fee is due, please charge our Deposit Account No. 22-0185, under Order No. 21713-00029-US1 from which the undersigned is authorized to draw.

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